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calculating the amount of movement of the object based upon the movement of [the] a new granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

2. A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector to generate a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor to directly pick up without a lens said granular speck pattern used as an index;

an A/D converter coupled to said line sensor to convert an analog signal supplied from said line sensor to a digital signal;

a processing unit coupled to the A/D converter to calculate the amount of movement of said object toward and away from said sensor on the basis of movement of the granular speck in said pattern with respect to a change in the pixel interval of said granular speck pattern picked up by said line sensor and represented by said A/D converted signal; and

a display coupled to said processing unit to display the amount of movement calculated by said processing unit.

6. A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser projector for generating a granular speck pattern corresponding to the surface of an object to be measured;

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a line sensor positioned to detect directly without a lens said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object toward and away from said sensor on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said processing unit.

7. A lensless method for measuring the amount which an object to be measured has moved by detecting a granular speck pattern reflected by a laser beam comprising steps of:

irradiating an object to be measured with a laser beam;

directly detecting a granular speck pattern generated by the reflecting laser beam by a detector and using the detected pattern as an index;

moving the object with respect to said detector;

calculating the amount of movement of the object based upon movement of the granular speck pattern corresponding to the moved position of the object with respect to said index; and

displaying a result of the calculation as a numerical value of the measured amount of movement.

8. A lensless apparatus for measuring the amount which an object to be measured has moved using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a laser source for generating a granular speck pattern corresponding to a rough surface of an object to be measured;

a line sensor positioned to detect directly without a lens said granular speck pattern as an index;

a processing unit coupled to said line sensor to calculate the amount of movement of said object on the basis of movement of a granular speck in said granular speck pattern with respect to a pixel interval of said granular speck pattern detected by said line sensor; and

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a display coupled to said processing unit to display the amount of movement calculated by said processing unit.

13. A lensless apparatus for measuring the amount which an object to be measured has moved in a plane and back and forth using a granular speck pattern generated by a reflecting laser beam, said apparatus comprising:

a collimated light source for generating a granular speck pattern corresponding to the surface of an object to be measured;

a line sensor positioned to detect directly without a lens said granular speck pattern as an index; and

an electrical circuit coupled to said line sensor for calculating the amount of movement of said object on the basis of movement of the granular speck in said pattern with respect to a pixel interval of said granular speck pattern picked up by said line sensor and displaying the amount of movement calculated by said processing unit.